
Maintenance

This section includes information on the following:

- maintenance commands associated with the Meridian 1 system
- maintenance commands associated with the Meridian Companion Administration Terminal
- system failures (exceptions)
- alarm and event descriptions and actions
- hardware maintenance actions

Using maintenance commands

A number of commands in LD 32 can be used to examine Meridian Companion from the perspective of the Meridian 1 system. The Meridian Companion Administration Terminal can be used to examine the Meridian Companion system components to determine that they function properly.

Meridian 1 card maintenance

Table 25 shows commands available in LD 32 for the CMCC, CMRC, and CMLC. For additional information on these commands, refer to *X11 Input/Output Guide*. Some of the commands vary slightly for Option 11 systems (refer to Option 11 documentation).

Table 25: Maintenance and diagnostic commands in LD 32

Commands	System responses	Description
STAT I s	shows status	Indicates whether unit is idle, busy, or disabled.
STAT (loop)	shows status	Indicates status of loop.
STAT I s c	shows status	Indicates status of specified card.
STAT I s c u	shows status	Indicates status of specified unit.
ENLC I s c	enables card	Enables the specified card.
ENLL loop	enables loop	Enables network loop.
ENLN loop	enables card	Enables network card with specified loop.
ENLS I s	enables shelf	Enables specified shelf.
ENLU I s c u	enables unit	Specified unit enabled.
DISC I s c	disables card	Removes specified card and associated TNs from operation.
DISI I s c	disables card	Disables specified card when it becomes idle.
DISL loop	disables loop	Disables network loop.
DISN loop	disables network card	Disables network card containing specified loop.
DISS I s	disables shelf	Disables all cards on specified shelf.
DISU I s c u	disables unit	Disables specified unit.

Administration Terminal maintenance commands

Maintenance programming enables you to monitor and control Meridian Companion operation at a hardware component level: system, card, WTN TCM device.

All maintenance functions described in this section start at the Maintenance menu. To access the Maintenance menu through the Administration Terminal:

1. Press **f**••, . The display shows Password: .
2. Enter the Installer password. The display shows A. Configuration .
3. Press * until the display shows C. Maintenance .

Use the following sections to do Maintenance programming.

4. To end a session, press ® .

To access maintenance functions through Companion Manager, refer to *Companion Manager Installation and Operations Guide*.

Maintenance features

There are six features in the maintenance menu:

- system status
- card status
- WTN status
- TCM status
- Event/alarm log
- Administration log

The first four features are typically used when a problem or a system change occurs. The log features should be used to verify, record, and clear the corresponding logs periodically.

The softkeys common to many of these tasks are labeled ENBL (enable) and DSBL (disable). The confirming messages associated with the DSBL key are Disable at once? and Disable at idle? . The softkey appears only when the state is Busy or Wait Idle .

The following maintenance tasks can be performed using the Administration Terminal, as shown, or Companion Manager. For Companion Manager instructions, see the *Companion Manager Installation and Operations Guide*.

System status

The system status feature enables you to check the system type and state and perform system level maintenance actions.

1. Press **f••**, and enter the Installer password.
2. From A. Configuration , press * until the display shows C. Maintenance .
3. Press ^ . The display shows 1. System Status .
4. Press ^ . The display shows the product name (MC) and protocol (PCI).
5. Press STATE to see the operational state of the system, described in Table 26.
6. Press TYPE at any point to reset the display to show the product name and protocol, as indicated in step 4.
7. Press ^ to see the software version and release number.
8. Press ® to exit, or % to continue in Maintenance programming.

Note: The system can be disabled if the state is Busy , Failed , Idle , or Wait Idle . Pressing DSBL shows Disable at once? on the display. You can select YES (the system enters the Disabling state), CHANGE (you are asked whether to disable upon idle; a YES response places the system in the Wait Idle state).

Table 26: System states and actions

State	Meaning	Possible action
Idle	System is enabled but not in use (no active calls or links).	<u>DSBL</u> or <u>TYPE</u>
Disabling	Meridian Companion system is being disabled due to system or user action.	<u>TYPE</u>
Enabling	System is being enabled following installation or a reset.	<u>TYPE</u>
Busy	System is in use.	^ to see the number of busy WTNs, ^ then * to see the number of TCM devices, <u>DSBL</u> , or <u>TYPE</u>
Wait Idle	All idle WTNs and TCM devices have been disabled; active WTNs and TCM devices will be disabled as soon as calls terminate.	<u>DSBL</u> to disable immediately; ^ to see the number of busy WTNs, ^ then * to see the number of TCM devices; otherwise, <u>TYPE</u>
Dsbl Sys	All system WTNs and TCM devices have been disabled due to a system detected exception.	treat exception that caused system to become disabled
Dsbl User	All system WTNs have been disabled by the user.	<u>ENBL</u> to reenable, or <u>TYPE</u>

Card status

The card status feature enables you to check the card type and state and perform card level maintenance actions.

1. Press **f••**, and enter the Installer password.
2. From A. Configuration, press ***** until the display shows C. Maintenance .
3. Press **^** , then press ***** until the display shows
2. Card Status .
4. Press **^** . The display shows Show card .
5. You can enter a number or press **^** to see the first card. The display shows Cnn: followed by the card type: CMCC , CMRC , or CMLC .
6. Press **^** to see the firmware version of the current card.
7. Press STATE to see the card state described in Table 27.

Note: Pressing TYPE at any point resets the display to show the card number and type, as indicated in step 5.

8. Press ***** and **&** to view other cards.
9. Press **®** to exit, or **%** to continue in Maintenance programming.

Note: The card can be disabled if the state is Busy , Failed , Idle , or Wait Idle. Pressing DSBL shows the question Disable at once? on the display. You can select YES (the card enters the Disabling state), CHANGE (you are asked whether to disable upon idle; a YES response places the card in the Wait Idle state).

Table 27: Card states and actions

State	Meaning	Possible action
Idle	Card is enabled but not in use.	<u>TYPE</u>
Enabling	Card is being enabled.	<u>TYPE</u>
Disabling	Card is being disabled.	<u>TYPE</u>
Failed	TCM device has failed.	<u>DSBL</u> takes failed TCM device offline and sets the state to Dsbl User; verify power and wiring
Unequipped	No operational card is in this slot; normally this appears only if the slot is empty during a disable/enable process.	<u>DSBL</u>
Busy	Card is in use.	^ to see the number of busy WTNs, ^ then * to see the number of TCM devices, <u>DSBL</u> , or <u>TYPE</u>
Wait Idle	All idle WTNs and TCM devices are immediately disabled; remaining WTNs and TCM devices will be disabled as soon as calls terminate.	<u>DSBL</u> to disable immediately; ^ to see the number of busy WTNs, ^ then * to see the number of TCM devices; otherwise, <u>TYPE</u>
Dsbl Sys	All card WTNs and TCM devices have been disabled due to a system detected exception.	treat exception that caused system to become disabled
Dsbl User	All card WTNs have been disabled by the user.	<u>ENBL</u> to reenable, or <u>TYPE</u>

Wireless Terminal Number (WTN) status

The WTN status feature enables you to check the WTN type and status. There are no maintenance actions available because they can be performed from the Meridian 1 side.

1. Press **f••**, and enter the Installer password.
2. From A. Configuration , press * until the display shows C. Maintenance.
3. Press ^ , then press * until the display shows 3. WTN Status .
4. Press ^ . Enter the WTN.
5. You can enter a number or press ^ to see the first WTN.

The display shows W followed by the four-digit WTN and the WTN type.

6. Press STATE to see the WTN state as shown in Table 28.

Note: Pressing TYPE at any point resets the display so it shows the card number and type as indicated in step 3.

7. Use * and & to view other WTNs.
8. Press ® to exit or % to continue in Maintenance programming.

Table 28: WTN states and actions

State	Meaning	Possible action
Idle	WTN is enabled but not in use.	<u>TYPE</u>
Disabling	The card is in the process of being disabled.	<u>TYPE</u>
Failed	The WTN module has failed.	handle at card level
Busy	WTN is in use.	<u>TYPE</u>
Wait Idle	The card has been disabled when idle. This WTN still has an active call. It will be disabled as soon as the call terminates.	handle at card level
Maint	The WTN has been disabled from the Meridian 1 side.	After the Meridian 1 system enables the WTN, the state becomes Idle or Busy.
Dsbl User	All WTNs have been disabled by user.	handle at card level
Dsbl Sys	All WTNs have been disabled by system.	treat exception that caused WTN to become disabled

TCM status

The TCM status feature enables you to check the TCM device type and status and perform TCM level maintenance actions.

1. Press **f**, and enter the Installer password.
2. From A. Configuration, press ***** until the display shows C. Maintenance.
3. Press **^**, then press ***** until the display shows
4. TCM Status .
4. Press **^**. The display shows Show TCM: .
5. You can enter a TCM device number or press **^** to see the first TCM device.

The display shows T followed by the five-digit TCM device port number and the TCM device type: BS-1 (Base Station), RAD , or 7310 (M7310 Administration Terminal).

6. If the TCM device has associated software or firmware, you can press **^** to see the version of the software/firmware. (If there is no software/firmware, the **^** button does not appear.)
7. Press STATE to see the TCM device state as shown in Table 29.

The TCM device can be disabled if the state is Idle , Busy , Failed , Maint , CSC Radio , Equipped , or Wait Idle . Pressing DSBL shows Disable at once? on the display. You can select YES (the TCM device enters the Disabling state), CHANGE (you are asked whether to disable upon idle; a YES response places the TCM device in the Wait Idle state), or TYPE .

Note: Pressing TYPE at any point resets the display so it shows the TCM device number and type as indicated in step 5.

8. Press ***** or **&** to view other TCM devices.

9. Press ® to exit or % to continue in Maintenance programming.

Note: The Administration Terminal cannot be disabled.

Table 29: TCM device states and actions

State	Meaning	Possible action
Idle	TCM device is enabled but not in use.	<u>TYPE</u>
Disabling	TCM device is being disabled.	<u>TYPE</u>
Enabling	TCM device is being enabled following installation or a reset.	<u>TYPE</u>
Failed	The TCM device has failed.	<u>DSBL</u> takes the failed device offline and sets the state to Dsbl User.
Equippd	Will display for RAD or 7310 TCM.	<u>DSBL</u>
Unequippd	No TCM device has ever been associated with the port number (type = NONE).	The state becomes Idle or Busy when a TCM device becomes associated with the port number.
Busy	TCM device is in use.	<u>DSBL</u> or <u>TYPE</u>
Wait Idle	TCM device will be disabled as soon as current traffic terminates.	<u>DSBL</u> to disable immediately; <u>TYPE</u>
Maint	The TCM device is not in normal operating mode (the Base Stations are not configured into cells, or they are downloading new software, or CDS is running).	Configure using the Mobility Data programming features.
CSC Radio	Radio is in use as a common signalling channel. There is one radio per cell designated as a CSC radio.	<u>DSBL</u> or <u>TYPE</u>
Dsbl User	User has disabled TCM device.	<u>ENBL</u> or <u>TYPE</u>
Dsbl Sys	System has disabled TCM device.	Treat exception that caused TCM device to become disabled.

Event/Alarm log

Status (alarm and event) messages appear on the display and are stored in the Event/Alarm log.

Alarms indicate important and sometimes abnormal system conditions. The details of every alarm, including date and time, should be noted as soon as possible, and the alarm cleared. Alarms may require some action to resolve.

With the Event/Alarm log you can

- check the alarms and events that occurred
- check when alarms and events occurred
- check a current alarm
- check the number of consecutive occurrences of an event or an alarm
- erase the log

ATTENTION!

Because the Event/Alarm log holds a maximum of 50 events, you should check and record these alarms and events periodically. Erase the log after dealing with the alarms and events. If your system is also equipped with Companion Manager, these logs can be printed as a report.

When the log is full important alarms are lost when new alarms of higher priority come in.

Each event is assigned a severity number. An S preceding this number (for example, S4) may appear in the event message. S1 has the lowest priority. If the log is full, new event messages with a higher severity number replace existing event messages of a lower severity. For this reason, check event messages at regular intervals. You should then deal with all messages before they are replaced.

If an event or alarm occurs while you are using the Administration Terminal for programming, your session will not be disrupted. Instead, the alarm message and beep will occur after the programming session ends.

The Event/alarm log indicates what alarms and events occurred, when they occurred, and how many times they occurred.

Entering the Event/Alarm log

1. Press **f**••, and enter the Installer password.
2. From A. Configuration, press * until the display shows C. Maintenance .
3. Press ^ , then press * until the display shows 5. Evnt/Alrm Log .
4. Press ^ . The display shows Start of new log or Start of log .
5. Press * or & to search through alarms and events in the log.
6. Press % twice to continue in Maintenance programming.

Checking the most recent alarm

1. Enter the Event/Alarm log.
2. Press **ALARM** . The display shows an alarm code if there is an uncleared alarm, or No current alarm .
3. Press **EXIT** to return to the Event/Alarm log, or press **OK** if an alarm message was displayed.

Checking when an alarm or event occurred

1. Enter the Event/Alarm log.
2. Press * or & to search through the alarms and events in the log.
3. Press **TIME** . The display shows the date and time that the alarm or event last occurred, then returns to the alarm.

Checking consecutive repetitions of an alarm or event

1. Enter the Event/Alarm log.
2. Press * or & to search through the alarms and events in the log.
3. Press **REPEAT** . The display shows the number of consecutive times that the alarm or event occurred, then returns to the previous display.

Erasing the log

1. Enter the Event/Alarm log.
2. Press ERASE . The display shows Erase log?.
3. Press YES . If no new alarms or events have been added since the list was entered, the log is erased and the display shows Log is empty , then 5.Evnt/Alrm Log . If new alarms or events have been added since the list was entered, the display shows Log has changed .

Administration log

The Administration log lists event messages for administrative events such as system initialization, Configuration sessions in which a change was made, invalid password attempts, and password changes. By using this feature you can

- check what events occurred
- check when the events occurred
- check the number of consecutive occurrences of an event
- erase the log

ATTENTION!

Because the Administration log holds a maximum of 10 events, you should verify and record these events periodically. Erase the log after dealing with the events. If your system is also equipped with Companion Manager, these logs can be printed as a report.

Each event is assigned a severity number. An S preceding this number (for example, S4) may appear in the event message. S1 has the lowest priority. If the log is full, new event messages with a higher severity number replace existing event messages of a lower severity. For this reason, check event messages at regular intervals. You should deal with all messages before they are replaced.

Entering the Administration log

1. Press **f****, and enter the Installer password.
2. From A. Configuration , press ***** until the display shows C. Maintenance .
3. Press **^** , then press ***** until the display shows 6. Admin Log .
4. Press **^** . The display shows Start of new log or Start of log .
5. Press **ALARM** . The display shows an alarm code if there is a current alarm.
6. Press ***** or **&** to search through events in the log.

7. Press TIME to see the date and time of an alarm's most recent occurrence.
8. Press REPEAT to see how many times the alarm has occurred.
9. To erase the log, press ERASE .

Note: If new alarms have occurred since the log was accessed, the display shows Log has changed . Otherwise, the display shows Log is empty .

10. Press % to continue in Maintenance programming.

Checking when an event occurred

1. Enter the Administration log.
2. Press * or & to search through the events in the log.
3. Press TIME . The display shows the date and time that the event last occurred, then returns to the previous display.

Checking the most recent alarm

1. Enter the Administration log.
2. Press ALARM . The display shows an alarm code if there is an uncleared alarm, or No current alarm (see Table 34 on page 171).

Checking consecutive repetitions of an event or alarm

1. Enter the Administration log.
2. Press * or & to search through the events in the log.
3. Press REPEAT . The display shows the number of consecutive times that the event or alarm occurred, then returns to its previous display.

Erasing the Administration log

1. Enter the Administration log.
2. Press ERASE . The display shows Erase log? .
3. Press YES . If no new events have been added since the list was entered, the log is erased and the display shows Log is empty , then 6.Admin Log . If new events have been added since the list was entered, the display shows Log has changed .

Responding to event and alarm messages

The alarm messages are displayed on the Administration Terminal.

This is an example of an alarm message:	Alarm: 51-04
	TIME CLEAR

Report this alarm and the time it occurred to your installer or distributor.

Responding to an alarm code

When a problem occurs, alarm codes can take up to two minutes to be displayed on the Administration Terminal. If the system was turned off when the failure occurred, the alarm code appears two minutes after the system is turned on.

When you see an alarm code, follow these steps:

1. Record the alarm code.
2. To see when the alarm occurred, press TIME .
3. To clear the alarm, press CLEAR .
4. Determine the cause of the alarm using Table 34 on page 171.

System Reevaluation

ATTENTION!

Unless this is a new installation, system reevaluation disables the Meridian Companion system and should be performed after hours.

All active calls will be dropped when System Reevaluation begins.

When the physical system configuration, such as a Base Station layout, have changed significantly, you must run System Reevaluation so that the Meridian Companion system can adapt to these changes and provide optimum performance.

You will usually be notified when System Reevaluation is required.

You should run System Reevaluation when:

- new Base Stations have been added
- system has been relocated
- antenna settings have been changed

Keep these points in mind:

- If the system detects the need for System Re-evaluation, you will see Re-Eval required or Re-Eval recommended on the Administration Terminal. If re-evaluation is only recommended, you can clear the message if the system is unchanged, for example, if a faulty Base Station has been replaced.
- If you see Re-Eval recommended, it could be for the following two reasons:
 - a Base Station had lost power, or the TCM port had been disconnected and is now back in service
 - a Base Station has been replaced by another Base Station but the port has not changed

- If the antenna setting for a radio changes System Reevaluation will be required.
- If a Base Station is removed or added while System Reevaluation is running, the reevaluation procedure will take twice as long to complete.

ATTENTION!

System Reevaluation must be performed for the new configuration to take effect.

ATTENTION!

If you modify the Base Station configuration and repower the system before you execute a System Reevaluation, then a “UTAM test failed” alarm will be displayed and the system will disable wireless communication. Refer to Table 34 on page 171.

To run System Reevaluation, follow these steps:

1. Enter Configuration programming.
2. Press ^ . The display shows 1. Telephony Data .
3. Press * .. The display shows 2. Mobility Data .
4. Press ^ . The display shows Re-Evaluation .
5. Press ^ . The display shows Re-Eval status .
6. Press ^ . The display shows one of the following:

Message	Meaning	Action
Re-Eval required	The Meridian Companion system has detected a need for System Reevaluation.	Continue with step 7.

Message	Meaning	Action
Re-Eval not req.	The Meridian Companion system did not detect the need for System Reevaluation.	Continue with step 7 if desired.
Re-Eval recommended	The Meridian Companion system has detected a possible need for System Re-evaluation.	Decision left to installer's discretion: • continue with step 7 • schedule a re-evaluation • <u>CLEAR</u> to continue without running System Re-evaluation
Re-Eval in prog.	The Meridian Companion system is currently running System Reevaluation.	Press ® to exit and wait for display to show Re-Eval complete.
Re-Eval disabled	The Meridian Companion system has determined that System Reevaluation is not available at this time because the mobility has been disabled.	See either UTAM test failed alarm or UTAM code req'd alarm in "Troubleshooting an alarm" on page 171.
Re-Eval pending	System Reevaluation was requested but has not yet started.	Press ® to exit and wait for display to show Re-Eval in prog., Re-Eval complete .

7. Press CONTINUE . The display shows Re-Evaluate now? .
8. If you want to run System Reevaluation later, press NO and see "Setting a scheduled time or date" on page 136.

If you want to run System Reevaluation now, press YES . The display shows Calls will drop .

To exit with no impact, press ® or CANCEL .

ATTENTION!

System Reevaluation cannot be canceled once initiated.

9. Press EXECUTE . The display shows Re-Eval pending .
10. Press ® to exit. Re-Eval in prog. is displayed.
11. The display shows Re-Eval complete when the Reevaluation procedure is completed. Press CLEAR to clear the message.

Note: You may receive alarm messages during this process, refer to “Responding to an alarm code” for more information.

Note: Base Station download will increase the time by approximately 10 minutes.

Approximate run times for System Reevaluation are shown in the following table:

# Base Stations	Reevaluation run time (minutes)
20	6
40	14
60	19
80	23
100	28
120	32
>120	>34

Scheduling System Reevaluation

You can view the scheduled time for System Reevaluation or schedule a time to run System Reevaluation.

Verifying the scheduled time

1. Enter Configuration programming.
2. Press **^** . The display shows 1. Telephony Data .
3. Press ***** . The display shows 2. Mobility Data .
4. Press **^** . The display shows Re-Evaluation .
5. Press **^** . The display shows Re-Eval status .
6. Press ***** . The display shows Re-Eval schedule .
7. Press **^** . The display shows the time and date when System Reevaluation has been scheduled, or the display shows Not scheduled .
8. If the time and date displayed are correct, press **%** three times to continue in Configuration programming.

To schedule System Reevaluation or change the scheduled time, go to step 2 of “Setting a scheduled time or date”.

To cancel a scheduled System Reevaluation, press CANCEL .

Setting a scheduled time or date

Note: The system only accepts a date and time set later than the current date and time.

To set a scheduled time:

1. Complete steps 1 to 7 of “Verifying the scheduled time”.
2. Press CHANGE . The display shows Calls will drop at set time followed by the currently scheduled hour, or 0:01 if a time has not been scheduled.

If you do not want to change the scheduled time, go to step 4.

3. To schedule the time, press CHANGE . The display shows Hour: followed by the currently scheduled hour (00 if none scheduled).

- a. Press CHANGE . The display shows Hour: . If you do not want to change the hour, go to step 3c.
 - b. Enter the hour in 12-hour or 24-hour format, as one or two digits.
 - c. Press * . The display shows Minutes: followed by the currently scheduled minutes (01 if none scheduled). If you do not want to change the minutes, go to step 3f.
 - d. Press CHANGE . The display shows Minutes: .
 - e. Enter the minutes as one or two digits.
 - f. Press * . If you entered an hour less than or equal to 12, the display prompts you with AM or PM . If you entered an hour greater than 12, go to step 4a to set the date or go to step 5 to continue in Configuration programming.
 - g. Press CHANGE to select AM or PM.
4. To schedule the date, press * . The display shows Date followed by the currently scheduled date (today's date if none scheduled).

If you do not want to change the scheduled date, press % four times to continue in Configuration programming. You may hear a beep after the first % .

To continue scheduling the date:

- a. Press CHANGE . The display shows Year: followed by the currently scheduled year. If you do not want to change the year, go to step 4d.
- b. Press CHANGE . The display shows Year: .
- c. Enter the last two digits of the year.
- d. Press * . The display shows Month: followed by the currently scheduled month. If you do not want to change the month, go to step 4g.
- e. Press CHANGE . The display shows Month: .
- f. Enter the month as one or two digits between 1 and 12.
- g. Press * . The display shows Day: followed by the currently scheduled day. If you do not want to change the day, go to step 5.
- h. Press CHANGE . The display shows Day: .

- i. Enter the day of the month as one or two digits between 1 and 31.
5. Press % three times to continue in Configuration programming. You may hear a beep after the second % .

Modifying your system

Adding Portable Credits

You must purchase credits first, confirm your order before proceeding.

To register additional portables you must obtain Portable Credit Codes for the number of portables you need. These codes are then entered into the system to apply the credits. You can obtain additional Portable Credit Codes whenever you need to expand the number of portables, up to a maximum of 240 portables per Meridian Companion system (160 on an Option 11 system).

Note: You must ensure that the system has the required hardware to support the number of portables to be registered.

To obtain Portable Credits:

1. Confirm order.
2. Call Northern Telecom Customer Response Center at 1-800-321-2649 to get a Portable Credit Code to increase the number of portables you can register to a system.

You will need to provide the Companion ID, the site zip code, and the SSN.

Note: The Companion ID and the SSN should be recorded in the *Meridian Companion Programming and Provisioning Record*. If the SSN is not recorded, you can do so following step 7.

3. Record the Portable Credit Code in the *Meridian Companion Programming and Provisioning Record*.
4. Enter Configuration programming.
5. Press ^ .
6. Press & . The display shows 4. Software Codes .
7. Press ^ . The display shows SSN:nnnnnnnn .

8. Press * . The display shows Codes .
9. Press ^ . The display shows Code 1: . Enter the first code number. Use BKSP for corrections.
10. Press OK . The display shows Code 2: . Enter the second code number.
11. Press OK . The display shows Code 3: . Enter the third code number.
12. Press OK . The display shows Entry Successful , then Codes .

Note: If the code entry is unsuccessful, the display shows Invalid code. If this happens, reenter the code or call Northern Telecom Customer Response Center for assistance.

13. Follow the procedure “Verifying Portable Credits” on page 114 or press ® to exit.

Adding Radio Credits

Radio Credits must have been ordered before you can proceed with the following procedure.

To increase the number of Radio Credits assigned to a system you must obtain a UTAM Activation Code for the number of Radio Credits you require. The code is then entered into the system.

To modify radio credits:

1. Call Northern Telecom Customer Response Center at 1-800-321-2649 to get a UTAM Activation Code to change the number of Radio Credits assigned to a system.

You will need to provide the Companion ID, the site zip code, and the SSN.

Note: The Companion ID should be recorded in the *Meridian Companion Programming and Provisioning Record*.

2. Record the UTAM Activation Code in the *Meridian Companion Programming and Provisioning Record*.
3. Enter Configuration programming.
4. Press ^ then press & . The display shows
4. Software Codes .

5. Press **^** . The display shows SSN:nnnnnnnn .
6. Press ***** . The display shows Codes .
7. Press **^** . The display shows Code 1: . Enter the first code number. Use **BKSP** for corrections.
8. Press **OK** . The display shows Code 2: . Enter the second code number.
9. Press **OK** . The display shows Code 3: . Enter the third code number.
10. Press **OK** . The display shows Entry Successful , then Codes .

Note: If the code entry is unsuccessful, the display shows Invalid code . If this happens, reenter the code or call Northern Telecom Customer Response Center for assistance.

11. Follow the procedure “Verifying Radio Credits” on page 170 or press **@** to exit.

Activating a disabled system

A disabled wireless system implies that Base Stations and portables are not operational.

A disabled system could occur after a power interruption to the system (see alarm UTAM test failed in Table 34 on page 171 for more information). If following the instructions in Table 34 does not correct the problem, a UTAM Recovery Code will be required to bring the system back on-line.

To obtain and enter a code:

1. Call Northern Telecom Customer Response Center at 1-800-321-2649 to get a UTAM Recovery Code.

You will need to provide the Companion ID, the site zip code, and the SSN.

Note: The Companion ID should be recorded in the *Meridian Companion Programming and Provisioning Record*.

2. Record the UTAM Recovery Code in the *Meridian Companion Programming and Provisioning Record*.
3. Enter Configuration programming. Press **^** .
4. Press **&** . The display shows 4. Software Codes .

5. Press **^** . The display shows SSN:nnnnnnnn .
6. Press ***** . The display shows Codes .
7. Press **^** . The display shows Code 1: . Enter the first code number. Use **BKSP** for corrections.
8. Press **OK** . The display shows Code 2: . Enter the second code number.
9. Press **OK** . The display shows Code 3: . Enter the third code number.
10. Press **OK** . The display shows Entry successful , then Codes . A few moments after exiting Configuration programming, if the code was entered properly, you should see System online .

Note: If the code entry is unsuccessful, the display shows Invalid code . If this happens, reenter the code or call Northern Telecom Customer Response Center for assistance.

Replacing equipment

Adding or moving Base Stations

There are two reasons to add or move a Base Station:

- To correct deployment problems: holes in a coverage area or not enough Base Stations to handle traffic in a given cell.
- To facilitate system growth: increases in the coverage area or traffic.

Considerations involved include:

- Making sure that there are no more than four Base Stations per cell.
- Verifying that there are enough spare TCM units on existing cards; otherwise, new CMRC cards must be installed.
- If necessary, relocating the system card set to a new shelf to accommodate new cards. Refer to “Relocating the system” on page 145.
- Installing or upgrading RPIs if no spare power ports are available on existing RPIs.

To replace a Base Station, you do not have to power down the system. When you replace a Base Station, no portable registration information is lost. After

a short initialization sequence, the Base Station will be disabled and System Reevaluation will be required to make the Base Station operational and include it into the configuration.

ATTENTION!

Taking a Base Station out of service causes radio coverage to degrade.

The following instructions describe how to add or move a Base Station. The first eight steps apply only to moving a Base Station. If the Base Station is being added, begin with step 9.

1. Disable the associated TCM devices using the Administration Terminal or Companion Manager software. (See “TCM status” on page 124.)
2. If the Base Station is powered locally, unplug the power supply from the AC outlet.
3. If an external antenna is installed, unplug its coaxial cable from the Base Station.
4. Remove the Base Station cover.
5. Unplug the TELADAPT cable from the Base Station.
6. Hold the Base Station (to prevent it from falling) while applying upward pressure to it.
7. Lift the Base Station away from the bracket. Remove TCM and power wires from the mounting bracket.
8. Remove the mounting base.
9. Mount and connect the Base Station (see “Installing Base Stations and Base Station plug-top power supplies” on page 12).
10. Install and connect an additional RPI if required (see “Installing remote power interconnect units” on page 17).
11. Install an additional CMRC card if required (see “Installing Meridian Companion cards” on page 55).

12. Make wiring changes as necessary (see “Wiring the Time Compression Multiplexing lines” on page 47). Make sure that any exposed wiring has secondary protectors installed.
13. If a move, reenable previously disabled TCM devices as discussed in “TCM status” on page 124.
14. Perform System Reevaluation.
15. Note configuration changes in the *Meridian Companion Programming and Provisioning Record*.

Replacing a defective Base Station

To replace a Base Station, you do not have to power down the system. When you replace a Base Station, no portable registration information is lost.

You will receive a Re-eval recommended message. Your choices are to perform System Re-evaluation, schedule it for off-hours or CLEAR to disregard the message. You only need to perform the System Re-evaluation if the Base Station location changed in addition to replacing the defective Base Station.

If troubleshooting procedures (see “Troubleshooting a Base Station” on page 165) indicate that one or both Base Station radios are defective, the Base Station must be replaced as follows:

1. Disable the associated TCM devices using the Administration Terminal software. (See “TCM status” on page 124.)
2. If the Base Station is powered locally, unplug the power supply from the AC outlet.
3. If an external antenna is installed, unplug its coaxial cable from the Base Station.
4. Remove the Base Station cover.
5. Unplug the TELADAPT cable from the Base Station.
6. Hold the Base Station (to prevent it from falling) while applying upward pressure to it.
7. Lift the Base Station away from the bracket.

8. Mount and connect replacement Base Station (see “Installing Base Stations and Base Station plug-top power supplies” on page 12).
9. Reenable previously disabled TCM devices as discussed in “TCM status” on page 124.
10. You will receive a Re-Eval recommended message.

Adding expansion cards

Add CMRCs or CMLCs to the system if existing cards cannot accommodate additional Base Stations or portable telephones. Expansion cards can be added to a live system as long as existing cards and faceplate cables are undisturbed. Alternatively, the entire system can be disabled during installation.

New cards must be added to the right of an existing system. If there is no space for additional cards to the right of the current system, try to move other Meridian 1 cards to create sufficient space (after disabling the cards using the Meridian 1 Administration Terminal). If it is impossible to create enough space by moving cards, relocate the Meridian Companion cards as described in “Relocating the system” on page 145.

If installing a new CMRC, make sure enough power ports are available on existing RPIs to accommodate new Base Stations. If not, RPIs must be added or upgraded as described in “Installing remote power interconnect units” on page 17.

	STATIC! Wear a grounding strap. Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.
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To install the new cards:

1. Ensure the card slots are disabled on the Meridian 1 side. Refer to “Using maintenance commands” on page 115.
2. Insert the card or cards from *right to left* as described in “Installing Meridian Companion cards” on page 55.

The LEDs on the cards should come on immediately, flash three times, then remain on.

3. Faceplate cabling should be installed from *right to left*, with the last cable connecting the new card set to the live system. The SP LED on the CMCC card will begin flashing.

The card LEDs should go out about 20 seconds apart.

4. If a card LED remains on, refer to the troubleshooting guidelines described in “Troubleshooting a remote power interconnect unit” on page 166.
5. Approximately 30 seconds after the last card LED goes out the SP LED stops flashing. Use the Administration Terminal to confirm the status as shown in “Card status” on page 120.
6. Enable the new cards from the Meridian 1 system, as described in “Card status” on page 120.
7. Program the cards as shown in “Configuring the Meridian 1 for the Meridian Companion system” on page 99.

Relocating the system

When new cards are added, it may be necessary to relocate the existing system within the same IPE Module (shifting the cards to the left to accommodate new cards) or to another module. The following procedure applies to either case.



STATIC!

Wear a grounding strap.

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

Note: It is suggested that you perform a reevaluation just before relocating the system.

1. If using a new IPE or CE/PE Module, complete installation and preparation of that shelf.
2. Disable the Meridian Companion system.

3. Disable the corresponding IPE card slots from the Meridian 1 side, as described in “Meridian 1 card maintenance” on page 116.
4. If other module cards are involved in the relocation, disable them as described in “Meridian 1 card maintenance” on page 116.
5. Remove faceplate cables from the Meridian Companion cards.
Note the sequence of the cards; they must remain in the same order.
6. Remove the cards from the module.
7. Relocate and reenable other Meridian 1 IPE Module cards, as described in “Meridian 1 card maintenance” on page 116.
8. Relocate TCM connections for the Base Stations, RAD, and Administration Terminal by reconnecting the original cabling to the new card slots or by rewiring the cross connections.
9. Install the Meridian Companion cards in their new slots, keeping the original order.
10. Install faceplate cables from right to left so the last connection is made between the CMCC and the card to its right.

When the connection to the CMCC occurs, the system LED will resume flashing as the system begins to initialize the expansion cards. The card LED may turn off, then turn on as initialization progresses. When the system LED stops flashing and stays on, the initialization is complete. All card LEDs should also be solid.
11. Reprogram the Meridian 1 system to relocate portable telephone user TNs to their new card and unit (if applicable) positions. Enable the cards from the Meridian 1 side.

ATTENTION!

Maintain the same relative slot positions when reprogramming WTNs. Otherwise, users will not receive their calls.

12. The Administration Terminal will display System startup .

Note: If the Administration Terminal is not functioning, make sure that it is properly connected to the first port on the CMCC card.

Enter a maintenance session, reenable the system and press ® to exit.

Once the enabling is complete, the Administration Terminal will display one of the following:

- a Config warning message
- System online
- a Config failure message

13. Follow one of these strategies:
 - a. A configuration warning message is normal, and is accompanied by two options, RESET and RESUME . If M1 programming and rewiring are complete, press RESUME .
 - b. System online appears if the M1 reprogramming and rewiring has been into a new IPE module and the cards are occupying exactly the same slots as in the previous module. No action is required; proceed to step 18.
 - c. The configuration failure message indicates that the cards have not been installed in their original, correct order. Repeat steps 9 through 12.
14. After pressing RESUME , you will see System startup , followed by System online . If you get UTAM test failed , check that you have moved the wiring over properly. If Base Stations have not been properly reconnected to the new card slot and TCM device positions, a Re-Eval required message appears. Follow these steps:
 - a. Clear the alarm message (see “Responding to event and alarm messages” on page 131).
 - b. Rewire as necessary.
 - c. Restart the system.

Note: Auto-administration does not report missing Base Stations, just those that have been relocated to a different address. Even if the

Re-Eval required message does not appear, it is important to proceed with the next two verification steps.

15. Using the instructions in “Card status” on page 120, verify that all cards are present and appear in the Idle state.
16. Using the instructions in “TCM status” on page 124, verify that all Base Stations appear in the appropriate slots and that the Administration Terminal appears in the first CMCC port.
17. Set the proper system date and time as described in “Programming the system time and date” on page 82.
18. Verify proper operation by placing a call to at least one portable telephone on each card.

Replacing a defective expansion card



STATIC!

Wear a grounding strap.

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

“Troubleshooting cards” on page 161 lists the signs that indicate the need for a card replacement. Card replacement should be performed when the card is idle.

If the defective expansion card is on the far right of the Meridian Companion set of cards, it can simply be removed and replaced with a new card. If the card is in the middle of the card set, replace it by following these steps:

1. Disable the card from the Meridian 1 system and the Meridian Companion system.

2. Open the door of the IPE or CE/PE Module or expansion cabinet.

WARNING!

Each maintenance cable has a left plug and a right plug. Switching the plugs will disable the Meridian Companion system.

3. Attach the left plug of the CMRC or CMLC maintenance cable to the interboard faceplate cable harness or bypass cable harness to the left of the defective card.

Note: The maintenance cables for CMRC and CMLC are wired differently and cannot be interchanged.

4. Lifting the faceplate connectors, unplug the faceplate cable harness from J1 and J2 of the defective card.
5. Remove the defective card.
6. Replace the defective card with a new card.
7. Attach the faceplate cables to the new card.
8. Remove the maintenance cable as shown in Figure 32.
9. Reenable the card from the Meridian 1 system and the Meridian Companion system.

Replacing a defective ROM card

If troubleshooting indicates defects, replace the ROM card:

Note: It is suggested that you perform a system reevaluation prior to replacing the ROM card.

1. Disable all Meridian Companion cards from the Meridian 1 card using the DISC command in LD 32.
2. Ensure proper system grounding by following ESD practices.
3. Disconnect the faceplate cable on the CMCC.

All LEDs on other Meridian Companion cards turn on.

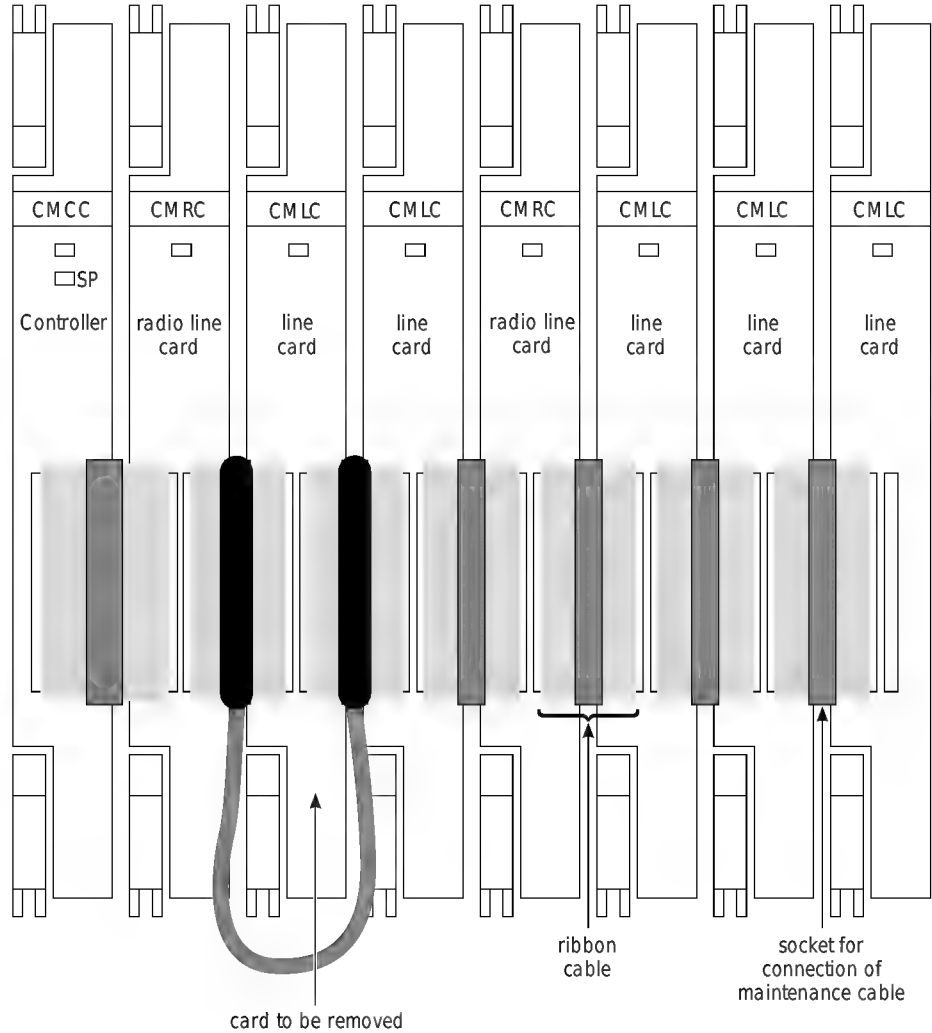
4. Remove the CMCC. The Meridian 1 system indicates that there is a card polling failure with the XMI001 LoopShelfCard.
5. Unscrew the ROM from the two plastic standoffs.
6. Slide the old ROM card from the right-angled connector mate P2.
7. Slide the new ROM card into the right-angled connector mate P2 on the CMCC.
8. Screw the new ROM card securely to the standoffs.
9. Reinstall the CMCC and reconnect faceplate cables.
10. Verify appropriate LED activity.

The Meridian 1 system indicates that card polling is reestablished with the XMI002 LoopShelfCard.

Wait for the system LED on the CMCC to stop flashing.

11. Use the Meridian Companion Administration Terminal to verify that the system is operating properly, that the ROM card software version is correct, and that there are no unexpected alarms or events.
12. Reset the Meridian Companion time and date.
13. Enable the cards from the Meridian 1 side.
14. Verify operation using a portable telephone.

Figure 32: Maintenance cable



Replacing a defective CMCC



STATIC!

Wear a grounding strap.

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

If troubleshooting procedures indicate that the CMCC should be replaced:

1. Disable all Meridian Companion cards from the Meridian 1 side.
2. Open the door of the IPE or CE/PE Module or expansion cabinet.
3. Lifting the faceplate connector, unplug the faceplate cable from the CMCC J2 slot.
4. Remove the defective CMCC card.
5. Remove the ROM from the defective CMCC.
6. Install the ROM on the new CMCC.
7. Install the new CMCC into the slot.
8. Reconnect the faceplate connector.
9. Reprogram the system as described in “Programming the Meridian Companion system” on page 69 or, if you have Companion Manager installed, perform a restore operation.
10. Reenable the cards from the Meridian 1 side.

Replacing a defective remote power interconnect unit

If “Troubleshooting a remote power interconnect unit” on page 166 indicates that the RPI is defective, replace it as follows:

1. Perform an orderly shutdown of the TCM ports associated with the RPI using the instructions in “TCM status” on page 124.
2. Unplug the RPI power cord from the AC outlet.
3. Press the release catch with a screwdriver and open the cover.

4. Disconnect the wires from the RPI.
5. Remove the two bottom screws.
6. Lift up and remove the RPI.
7. Hang the new RPI on the two top screws.
8. Install and fasten the two bottom screws.
9. Reconnect all the wires to the RPI.
10. Close the RPI cover.
11. Plug the RPI power cord into the AC outlet.
12. Reenable the TCM ports associated with the RPI using “TCM status” on page 124, and perform reevaluation if necessary.

Replacing an RPI power unit

If the problem appears to be related to the power supply unit, follow these instructions.

ATTENTION!

Unplugging an RPI takes any attached Base Station out of service.

1. Perform an orderly shutdown of the TCM ports associated with the RPI using the instructions in “TCM status” on page 124.
2. Unplug the RPI power cord from the AC outlet.
3. Press the release catch with a screwdriver and open the cover.
4. Disconnect the jumper lead, grounding plates, grounding strap, and cable from the connection board.
5. Unscrew the power supply unit and remove it.
6. Place the new power supply unit and fasten its screws.
7. Connect the jumper lead, grounding plates, grounding strap, and cable from the connector board.
8. Close the cover.

9. Plug the RPI power cord into the AC outlet.
10. Reenable the TCM ports associated with the RPI using “TCM status” on page 124 and perform reevaluation if necessary.

Replacing a defective Remote Access Device

Remove it, then replace it with a new unit following instructions in “Installing a Remote Access Device” on page 43.

Replacing a defective Administration Terminal

A system Administration Terminal that cannot access the Meridian Companion system may be defective. To replace the defective terminal, disconnect its telephone cord, then install a new terminal using the instructions in “Installing a Companion Administration Terminal” on page 38.

Portable

To replace a portable:

1. Deregister the portable from all systems to which it is registered.
2. Register the new portable following the instructions in “Registering portable telephones” on page 112.

Entering codes for system replacement and recovery

A Regression Code restores an original SSN. UTAM activation codes and portable credit codes only work with the original SSN. A Regression Code cannot be reused. You may need a regression code if one of the following conditions occurs:

- a defective Controller is replaced
- a Controller has lost its System Security Number (SSN) due to a power outage for more than 72 hours

If you need a Regression Code:

1. Retrieve and record the new System Security Number once the system is powered up. See page 92 for information on retrieving SSN.

2. Locate the following information in the *Meridian Companion Programming and Provisioning Record*.
 - original SSN
 - all previous codes recorded on the “UTAM Activation and Portable Credit Codes” table
3. Call Northern Telecom Customer Response Center at 1-800-321-2649 to request a Regression Code.

You will need to provide them with the original and new SSN, Companion ID, and site zip code.
4. Note the Regression Code.

Note: A Regression Code cannot be reused. Do not record this code in the Programming Record.
5. To enter the Regression Code:
 - a. Press *f* , then *••* , the display shows Password: . Enter the Installer password.
 - b. The display shows A. Configuration . If the password is incorrect, the display shows Password: . Press RETRY , and enter the password again.
 - c. Press *^* . The display shows 1. Telephony Data .
 - d. Press *&* . The display shows 4. Software Codes .
 - e. Press *^* until the display shows Codes .
 - f. Press *^* . The display shows Code 1: . Enter the first code number of the Regression Code. Use BKSP for corrections.
 - g. Press OK . The display shows Code 2: . Enter the second code number.
 - h. Press OK . The display shows Code 3: . Enter the third code number.
 - i. Press OK . This will restore the system to its previous SSN.
6. If you have Companion Manager installed and have previously performed a system backup, perform a restore operation. If not, proceed with the following steps.

7. Repeat steps 5e to 5i for each code recorded on the *Meridian Companion Programming Record*.
8. Verify that the correct number of Portable Credits and Radio Credits is available. (See “Verifying Portable Credits.”)
9. Reenter all programming data.
10. Reregister all portables.

Handling Meridian Companion exceptions

An exception during system initialization or operation can disable the system, except for the Administration Terminal, dropping all calls. The Administration Terminal displays an exception message, preempting any existing alarm message, as the system enters a disabled state.

The two defined Meridian Companion abnormalities relate to configuration inconsistencies and are described in the following text under “Config warning: Recoverable inconsistency” and “Config failure: Nonrecoverable inconsistency.”

During a Meridian Companion exception, the feature key is disabled, preventing you from entering a feature session. The only available actions are RESET and RESUME, as shown by the softkeys and described below.

Config warning: Recoverable inconsistency

A recoverable inconsistency occurs only during system startup after system cards have been relocated (moved as a group without changing relative card positions; see “Relocating the system” on page 145). It serves to remind the installer that all WTNs must be reprogrammed from the Meridian 1 system and that MDF cabling must be consistent with the new card locations.

The message Config Warning appears after initialization. If the reprogramming and cabling have been performed correctly, you can press RESUME to tell the system to overwrite the old position information and reactivate the system.

Otherwise, you must press RESET. Reset triggers the installation procedure. A warning message informs you that all data will be erased.

Config failure: Nonrecoverable inconsistency

A nonrecoverable inconsistency can occur during startup or during operation when the system determines that the cards are in a different order from the configuration stored in memory. Card type order has not been preserved, making portable telephone registration data and system configuration data invalid. This can occur if a previously programmed CMCC has been moved to another Meridian 1 system with a different expansion card configuration, or if an installer has replaced an existing CMLC with a CMRC to add Base Station capacity.

The message Config Failure appears. You can restore the card configuration to its original state, then press RESUME.

To keep the new configuration, you must press RESET. Reset triggers the installation procedure. A warning message informs you that all data will be erased.

If you press RESUME without correcting the problem that triggered the Config Failure (by returning cards to their old positions), the system will reset itself, once again detect an inconsistency, and display the message again.

Troubleshooting

When evaluating malfunctions, it might be useful to refer to “Normal LED behavior upon installation” on page 56.

General troubleshooting procedures

To carry out general troubleshooting procedures, use the following table. These procedures are most effective if you carry them out in the order they are ranked.

Main task	Steps to follow
1. Diagnose the trouble.	Ask the users for information about: • the type of problem they have experienced (related to placing or receiving calls, dropped calls or noise, or to problems with a feature) • how frequently the problems have occurred • where the problems have occurred • how many portables are affected
2. Check how a feature is being used.	A problem may have been reported because of a misunderstanding about how a feature works. Confirm that the person who reported a problem understands the intended use and operation of any feature in question.
3. Check that you can access host switch features from the Meridian Companion system.	To verify if the access lines have been programmed correctly, try the host switch features on two or more portables.

Main task	Steps to follow
4. Check for programming errors.	Check that the programming recorded in the <i>Meridian Companion Programming and Provisioning Record</i> is correct for the intended operation of the system. See the specific procedures for troubleshooting problems in this chapter.
5. Check wiring and hardware connections.	Check the wiring and hardware connections. Check for open circuits through the secondary protectors for applications with exposed wiring. Refer to procedures in “Troubleshooting cards” on page 161.
6. Check equipment defects.	If hardware is defective, replace it. If the problem requires expert advice, follow your company's procedure for obtaining assistance.
7. Check wireless communication.	Check that you can make and receive calls from various portables. If there is no wireless activity, you may require a UTAM Activation Code, a UTAM Recovery Code, or a Regression Code from Northern Telecom Customer Response Center (1-800-321-2649).
8. Verify connection.	For each cell center in the system, verify that you can establish a connection with all the radios at that cell center. To identify a radio's cell, see “Identifying a radio's cell assignment” on page 98.

Troubleshooting power problems

If the power fails or if the Meridian Companion system is disconnected, all Configuration and Administration data is retained for 72 hours. Check the following if you experience a power failure:

Table 30: Power troubleshooting

Symptom	Possible problem and solution
Entire system is not working.	Make sure the IPE Module has power.
LEDs on one Base Station are off.	The Base Station or its power source may be defective. See “Troubleshooting a Base Station” on page 165.
LEDs on multiple Base Stations are off.	An RPI may be defective. See “Troubleshooting a remote power interconnect unit” on page 166.

After 72 hours without power the system may lose its SSN and you will have to obtain a Regression Code to restore wireless communication. See “Entering codes for system replacement and recovery” on page 154.

Troubleshooting cards

Troubleshoot cards using visual inspection and Meridian Companion maintenance.

1. Verify that LEDs are functioning properly as described in “Normal card LED behavior” on page 162.
2. Check the status of the cards as described in “Card status” on page 120.
3. Disable, then enable any suspicious card using the procedure described in “Card status” on page 120.
4. Repeat as necessary.

Normal card LED behavior

The following two tables describe incidents affecting LED behavior that occur after the system is operational.

Table 31: Incidents affecting system LED

Incident	Result
New card is added.	LED flashes as a new card is added to the live system. The flashing indicates that the card (and any associated TCM device) is initializing. (Flashing lasts approximately 30 seconds per card.) Following initialization, LED is off.
Warm reset or power up occurs.	Normal start-up sequence followed by flashing that continues until CMCC and all connected expansion cards have completed initialization. Then LED goes off and stays off.
Previous disconnected expansion card is reconnected to a live system.	LED flashes to indicate that the cards and any associated TCM devices are initializing. After initialization, LED turns off unless system detects that the cards are not in the same order as previously recorded (a nonrecoverable inconsistency), in which case system is disabled and LED changes from flashing to on until exception is cleared.
Administration Terminal or Companion Manager user disables system.	LED goes on.
System is powered up after being moved.	Normal start-up sequence followed by flashing that continues until CMCC and all connected expansion cards have completed initialization. After flashing stops, LED is on solid indicating system is disabled due to config warning.
System is powered up after CMRC or CMLC, or both have been rearranged.	Normal start-up sequence followed by flashing that continues until CMCC and all connected expansion cards have completed initialization. After flashing stops, LED is on solid indicating system disabled due to config failure.

After initialization, the card LED status depends on the following:

- whether the expansion card is connected to the CMCC
- whether the card has been enabled from the Meridian 1 system
- whether the card has been enabled by Meridian Companion from either the Administration Terminal or Companion Manager
- whether the Meridian Companion system is operating properly

Table 32: Card LED behavior

Connected to CMCC?	Meridian 1: enabled/disabled	Meridian Companion: enabled/disabled	Companion system power status	LED behavior
not connected	N/A	N/A	powering up	remain on after flashing three times
being connected	enabled	N/A	normal	go off quickly
already connected	enabled	N/A	powering up	flash three times, go on, then go off quickly
being connected	disabled	card and system enabled	normal	go off slowly
being connected	disabled	system disabled	normal	LEDs remain on
being connected	disabled	system enabled; individual cards disabled	normal	LEDs of disabled cards on; others go off slowly
already connected	disabled	card and system enabled	powering up	flash three times, go on, then go off slowly (one at a time, 20 seconds apart)
already connected	disabled	system disabled	normal	LEDs remain on

Table 32: Card LED behavior (continued)

Connected to CMCC?	Meridian 1: enabled/disabled	Meridian Companion: enabled/disabled	Companion system power status	LED behavior
already connected	disabled	system enabled; individual cards disabled	powering up	flash three times, go on, then LEDs of disabled cards stay on; others go off slowly
already connected	disabled	disabled	normal	LED goes on
already connected	reenabled from either side after being disabled from both sides		normal	LED goes off

Troubleshooting the Administration Terminal

1. Check that the time and date appear on the display.
2. Check the display. If the display is unreadable, ensure that the display contrast adjustment ($f \bullet \ddagger$) is adequate.
3. Check that power is *on* in the system.
4. Check that the Administration Terminal is connected to the correct port.
5. Check the 50-pin connectors at the system and make sure they are plugged in properly.
6. Check the 25-pair TCM cables at the distribution frame to make sure they are connected to the right ports.
7. Check the telephone wiring connections at the distribution frame to make sure the connections have been made on the appropriate connectors shown in the “Installing the hardware” chapter.
8. Replace the Administration Terminal with a working Administration Terminal. If the problem persists, see “Troubleshooting” on page 159.

Note: You should find between 18 and 21 V DC across the telephone wires when the Administration Terminal is disconnected.

Troubleshooting a Base Station

1. Verify that the green LED (the power indicator) is on.
2. Verify that the red light is not solid.

A solid red light indicates that both radios on the Base Station are busy with calls, that the system is downloading data to the Base Stations, or that the radios have not been assigned to a cell.

3. Verify that the red light is not flashing.

The red LED flashes for about 15 seconds when a Base Station is powered up. This is normal. If the red LED continues to flash, then one of the following problems may exist:

- The Base Station is not connected to the Controller or line card.
- The wiring to the Base Station is not correct. Check for open circuits through the secondary protectors for applications with exposed wiring.
- The two-way DC loop resistance of the power pair(s) between the RPI and the Base Station exceeds 100 Ω . Measure the loop resistance with an ohmmeter. If the resistance exceeds 100 Ω , install a second power pair.
- The Base Station or RPI is faulty.

If the red LED is flashing on multiple Base Stations, one of the following problems may exist:

- The CMCC or CMRC card associated with the Base Stations may not be in place.
 - The MDF cable may have been removed.
4. Verify that the power cord of the RPI is properly connected to a working AC outlet. If the Base Station is powered locally, verify that the power supply is properly connected to a working AC outlet and that the power supply cable is properly connected to the Base Station power connector.
 5. If an external antenna is installed, verify that the external antenna coaxial cable is properly connected to the BNC connector of the Base Station, and that the corresponding radio is programmed to have an external antenna. See “Setting the antenna type for a radio” on page 79.

6. Verify that the system has enough Radio Credits to support all the installed Base Stations. If it does not, call Northern Telecom Customer Response Center at 1-800-321-2649 for a UTAM Activation Code for the number of Radio Credits you are missing.

Troubleshooting a remote power interconnect unit

Multiple Base Station malfunctions usually indicate an RPI problem.

1. Verify that the card associated with the RPI is properly engaged in its slot.
2. Verify the Base Stations.
 - a. Check to see that the green light is *on*.
 - b. Check to see that the red light is not solid.

A solid red light indicates that both radios on the Base Station are busy, that the system is downloading data to the Base Stations, or that the radios have not been assigned to a cell.

- c. Check to see that the red light is not flashing.

The red light flashes for about 15 seconds when a Base Station is powered up. This is normal. If the red light continues to flash, then one of the following problems may exist:

- The system is not *on*.
- The Base Station is not connected to the system.
- The Base Station radios have not been assigned to a cell.
- The wiring to the Base Station is not correct.
- The two-way DC loop resistance of the power pair(s) between the RPI and the Base Station exceeds 100 Ω . Measure the loop resistance with an ohmmeter. If the resistance exceeds 100 Ω , install a second power pair.
- The distance between the RPI and the Base Station is in accordance with the values in Table 4 in the chapter “Installing the hardware.” If not, power the Base Station with a plug-top power supply, move the RPI closer to the Base Station or use two RPI power pairs if you were using only one.

- There is a faulty Base Station or RPI.
- 3. Verify that the RPI is connected to a working power source and that all connections to the RPI (power cord, jumper lead, input and output, etc.) are correct and secured.
- 4. Check that the UPS fuse is live.
 - a. Remove the RPI cover.
 - b. Unplug the RPI from the AC outlet.
 - c. Remove the fuse cover.
 - d. Visually inspect the fuse to see if it needs replacement. Replace the fuse if necessary.
 - e. Replace the fuse if necessary.
- 5. Make sure the TCM device wiring has been correctly installed.
- 6. If none of the Base Stations connected to the RPI (or to one of its Power Supply Units) is functioning correctly, replace the RPI (or Power Supply Unit).

Note: The left Power Supply Unit provides power through output connectors OBIX1 to OBIX8, and the right Power Supply Unit provides power through OBIX9 to OBIX16.
- 7. If only one or a few of the Base Stations seem faulty, try putting the Base Station on another RPI power pair connector. If you continue to have difficulty see “Troubleshooting a Base Station.

Troubleshooting portable telephone problems

When there is a problem with a portable telephone:

1. Make sure the portable telephone is designed to be compatible with Meridian Companion.
2. Verify that the portable telephone is on and that the battery is not low.
3. Establish a radio connection to get dial tone. (Ensure that the portable telephone's twinned desk telephone, if any, is idle.)

If no dial tone is present, the portable might not be registered. Verify that the system has available Portable Credits and try to register the portable again.

If the number of available Portable Credits is zero, then you will need to obtain additional credits before you can register the portable (see "Adding Portable Credits" in "Modifying your system.")

4. On a portable, press **Œ**. The display shows **FEATURE LIST**.
5. Press **”** or **'** until the display shows **Feature request**.
6. Press **SELECT**. The display shows **A-**.
7. Press **°°**. The display shows the number to which the portable telephone is registered.
8. Refer to Table 33 for a summary of troubleshooting techniques.

Table 33: Troubleshooting portable telephones

Problem	Cause	Solution
No link, phone icon does not go off hook; "connection failed" message appears.	The batteries are defective, not charged, or not installed. The portable is out of range of all working Base Stations. The portable telephone is not registered. All Base Stations are busy. Wrong system is selected.	Replace, charge, or install batteries. Ask technical support for assistance. Repeat registration process for the portable telephone. Retry call or move to another cell.
Link is established, but there is no dial tone.	Telephones are MADN, and the other telephone is off-hook. Meridian 1 programming problem: WTN is enabled but not configured.	Make sure other telephone is not off-hook. Ask technical support to check that the Meridian 1 system is correctly programmed.
Link is established, but there is an overflow tone.	The WTN module from the Companion side is disabled or defective or failed. The Meridian 1 TN or card is disabled, is defective, or has failed.	Ask technical support for assistance in correcting the Companion or Meridian 1 problem.
Voice quality is poor.	There is a portable telephone or system problem.	Try another portable telephone. If the problem still exists, it is related to the system (poor coverage) and should be reported to technical support. Otherwise, the portable telephone is defective and should be replaced.
Calls are frequently dropped.		

Verifying Radio Credits

1. Enter Configuration programming.
2. Press ^ . The display shows 1. Telephony Data .
3. Press * . The display shows 2. Mobility Data .
4. Press ^ . The display shows Re-Evaluation .
5. Press * . The display shows Radios .
6. Press ^ . The display shows Radio credits .
7. Press ^ . The display shows nnn Available and nnn Total . Verify that the total number of Radio Credits was enough to support the system you have just installed. If you have received a UTAM message 0 Available , verify that the total displayed is equal to what you thought you should have. If you received a UTAM test failed , verify the number of Base Stations.

Note 1: The number of Radio Credits must be double the number of Base Stations you have installed. Refer to *Meridian Companion Programming and Provisioning Record* to determine the number of Base Stations. Each Base Station has two radios so each Base Station requires two credits.

Note 2: As each Base Station is initialized the number of available Radio Credits will decrease accordingly.

Troubleshooting a RAD

There are two ways to tell if the RAD is not functioning properly:

- If the Administration Terminal can communicate with the Meridian Companion system but the remote PC cannot, the problem may be due to a malfunctioning RAD.
- The techniques described in “TCM status” on page 124 indicate that the RAD is either failed or that port is not equipped.

Troubleshooting an alarm

To troubleshoot an alarm, use the following table.

Table 34: Alarm troubleshooting

When you see this alarm	Meaning	Possible causes and actions
Alarm:10	All TCM devices, including the Administration Terminal, have been disconnected from the CMCC.	This alarm is usually discovered after the problem has been corrected (because the Administration Terminal is nonfunctional while the alarm is active). If it occurs unexpectedly: 1. Verify that the 25-pair cable connector is inserted properly. 2. If there are TCM devices connected to the system, check all the wiring associated with these TCM devices.
Alarm:11	The internal circuitry has failed	The CMCC is defective Replace the CMCC following the instructions on page 152.
Alarm:23-xx	Cell xx is out of service because there are no operational radios in that cell.	This alarm only occurs at the end of System Reevaluation. During the last step of reevaluation, or after a system restart, as the system was activating cell xx for use, it could not find a radio to serve as a CSC. Check for the presence of the Base Station in cell xx. If the Base Station is present and in maintenance state, execute System Reevaluation. If the Base Stations do not appear, check the wiring and power. Replace the Base Station if it is defective. After replacement, reexecute System Reevaluation.

Table 34: Alarm troubleshooting (continued)

When you see this alarm	Meaning	Possible causes and actions
Alarm:24	Wireless communication may be disabled the next time the system is powered up.	This message only occurs at the end of System Reevaluation. It could be due to one of the following: • The system has fewer than four cells. • The system is brought online before all Base Stations are properly connected. • There is a break in the power or TCM connections to some Base Stations. Note: Do not attempt to solve the problem by repowering. 1. Check that the correct number of Base Stations have been connected and that the system recognizes the Base Stations (refer to page 141). If all the Base Stations you expected to see are not showing or they are in a failed state, then check: • that the TCM wiring of Base Stations is correct • that there is power to the Base Stations and RPIs or plug-top power supplies • that the location and number of Base Stations is correct • that any Base Station Modules are properly connected to the Expansion ports 2. Once you have corrected the problem run a System Reevaluation (refer to “System Reevaluation” on page 132). If you continue to experience Alarm:24 after running System Reevaluation, you either have insufficient Base Stations or an insufficient deployment. Note: If on the next power interruption you have a disabled system, you will receive a UTAM test failed alarm. Refer to “UTAM code req'd” on page 175.

Table 34: Alarm troubleshooting (continued)

When you see this alarm	Meaning	Possible causes and actions
Alarm:50-cc	All Base Stations on card cc have become disconnected from the system for at least a minute. or Card cc , which was restarted more than 3 minutes ago, has no operating Base Stations.	The MDF cable from the IPE slot containing CMRC has been disconnected. Reconnect the cable. Power to all Base Stations connected to the CMRC card has been lost (RPI is defective or disconnected). Check that the RPI is connected or replace defective RPI. A faceplate cable in the chain between the CMCC and this CMRC has been disconnected or loosened from its connector. Remove and replace the cable. The CMRC is defective. Replace the CMRC.
Alarm:51-cc	All 16 WTNs on CMRC or CMLC have been disconnected from the system for at least a minute. or CMRC or CMLC cc, which was restarted more than 3 minutes ago, is still not operational	The CMRC has been disconnected from the IPE Module slot. Reconnect the CMRC. A faceplate cable in the chain between the CMCC and this CMRC or CMLC has been disconnected or loosened from its connector. Reconnect the cable. CMRC or CMLC has an internal defect. Replace it.
Alarm:53-ccuun	Internal Base Station error.	Depends on failure indicated in event code. See associated 30X event code in Table 36.
Alarm:56-ccuu	TCM device ccuu failure.	There is a problem with the wiring to the device. Reconnect the CMRC. The power to the TCM device has been interrupted. Reconnect the power. The device has an internal defect. Replace it.
Config warning	Cards have been relocated and system is disabled.	See "Handling Meridian Companion exceptions" on page 156.

Table 34: Alarm troubleshooting (continued)

When you see this alarm	Meaning	Possible causes and actions
Config failure	Cards have not been reinstalled in their original, correct order and the system is disabled.	See “Handling Meridian Companion exceptions” on page 156.
System coldstart	Nonrecoverable NVRAM corruption detected during restart. Cold start occurs automatically. This message only appears at power up.	This is normal for a new installation. If this occurs on repowering an existing system, it means that the system has lost its memory. Reprogram the system using the programming record. Reregister all portable telephones.
Re-Eval required	The Meridian Companion system has detected a need for System Reevaluation.	This message could have been caused because: • a new Base Station was added to the system • a Base Station was moved to a different port • a Base Station lost power and the TCM port location changed Run System Reevaluation immediately or schedule a System Reevaluation.
Re-Eval recommended	The Meridian Companion system has detected a possible need for System Re-evaluation.	This message could have been caused because • a Base Station was replaced with a new Base Station • a Base Station lost power but the TCM port did not change. Action left to installer's discretion: • continue with System Re-evaluation • schedule a re-evaluation • CLEAR the message and continue without running System Re-evaluation

Table 34: Alarm troubleshooting (continued)

When you see this alarm	Meaning	Possible causes and actions
UTAM code req'd	Wireless system is disabled.	This is normal for a new installation, follow the procedures under “Activating wireless communications” on page 89. The only other time this alarm should appear is if you are rebuilding a system: 1. Enter a UTAM Activation Code. See “Activating a new system” on page 92. 2. Obtain a Regression Code. See “Entering codes for system replacement and recovery” on page 154.
UTAM test failed	Wireless system is disabled. This alarm will appear only after a restart.	System detected an incorrect configuration, possibly due to malfunctioning equipment. 1. Use the Administration terminal or Companion Manager to verify that radios have initialized and are not defective (C. Maintenance). 2. Check • that there is power to the Base Stations and RPI or plug-top power supply • that the location and number of Base Stations is correct • that there are at least four cells in the system configuration • all connections to the CCMC • that there are sufficient Radio Credits to support the number of Base Stations you have connected 3. Restart the system with the correct system configuration. 4. The system may require a UTAM Recovery Code. See “Activating a disabled system” on page 140.

Table 34: Alarm troubleshooting (continued)

When you see this alarm	Meaning	Possible causes and actions
Radio cred req'd	Too many Base Stations have been connected to the system. This message will only appear after a restart.	Excessive Base Stations have been connected and the total available Radio Credits are insufficient to accommodate all the radios. Wireless communication remains disabled. System Reevaluation may be disabled. 1. Verify the total and available number of radio credits using the Administration Terminal. 2. Remove the excess Base Stations and restart the system. To determine the number of connected Base Stations to remove, subtract the total number of radio credits from the total number of connected Base Stations. Remember that each Base Station has two radios. See "Verifying Radio Credits" on page 170. If you have increased the number of Base Stations you may need a new UTAM Activation Code to cover the increase in Radios. Note: If Radio Credits are required then reevaluation is disabled.

Understanding event messages

Event messages appear as items in the Administration log or the Event/Alarm log. Most of these event messages appear during normal maintenance. An installer may view the event messages to diagnose a problem in the system.

Each event is assigned a severity number. An S preceding this number (for example, S4), may appear in the event message. S1 has the lowest priority. If the log is full, new event messages with a higher severity number replace existing event messages of a lower severity. For this reason, check event messages at regular intervals. You should deal with all messages before they are replaced.

Table 35: Event messages in the Event/alarm log

Event code	Meaning
EVT221	The Event/alarm log has been cleared.
EVT222	The debugging facility has been accessed.
EVT299	The system has been restarted after a power outage.
EVT301-ccuux	Radio ccuux cannot successfully receive the data image during download. Both radios belonging to the Base Station will be disabled. This may occur if the flash EEPROM is faulty. The Base Station should be replaced.
EVT302-ccuux	Radio ccuux cannot be written to during data transfer. Both radios belonging to the Base Station will be disabled. The Base Station's flash EEPROM is faulty. The Base Station should be replaced.
EVT303-ccuux	Radio ccuux cannot be synchronized with the other radios in the system. Both radios belonging to the Base Station will be disabled. The Base Station hardware is faulty. The Base Station should be replaced. Two events are raised: one for the B1 channel radio and another for the B2 channel radio. A corresponding alarm code 53 will occur
EVT304-ccuux	Radio ccuux cannot be synchronized with other radios because of system overload.

Table 35: Event messages in the Event/alarm log (continued)

Event code	Meaning
EVT305-ccuu2	A B2 channel radio (radio 2 in this case) cannot be synchronized because the B1 radio was disabled in maintenance. Both radios belonging to the Base Station (on port ccuu) will be disabled. The B1 radio must be operational to synchronize both radios of the Base Station with other radios in the system. Two events are raised: one for the B1 channel radio and another for the B2 channel radio. A corresponding alarm code 53 will occur.
EVT306-ccuu1	A radio (1 in this case) cannot be synchronized because there are no B2 channel radios. Both radios belonging to the Base Station (ccuu) will be disabled. Two events are raised: one for the B1 channel radio (as in this case) and another for the B2 channel radio. A corresponding alarm code 53 will occur.
EVT307-ccuux00	A recoverable radio fault has occurred. The radio will be reset. If a link is active when this error occurs, the link is dropped. Radio ccuux is returned to service.
EVT307-ccuux01	An unrecoverable radio fault has occurred. Radio ccuux will be disabled and taken out of service. If a link is active when this error occurs, the link is dropped. A corresponding alarm code 53 will occur.
EVT307-ccuux02	The built-in self-test on the Base Station has failed. Radio ccuux will be disabled and taken out of service. If a link is active when this error occurs, the link is dropped. A corresponding alarm code 53 will occur.
EVT308-ccuux	The Base Station is connected to a system that supports a radio protocol that Meridian Companion does not understand.
EVT680	Wireless communication has been disabled. This event will always precede a UTAM code req'd or UTAM test failed alarm in the Event/alarm log.
EVT681	A UTAM Activation Code or a Recovery Code was successfully entered.
EVT682 and EVT683	These are informational event codes for use by Northern Telecom.
EVT684	Reevaluation has been disabled due to an insufficient number of Radio Credits. This event is usually associated with a Radio cred req'd alarm.

Table 35: Event messages in the Event/alarm log (continued)

Event code	Meaning
EVT685	A scheduled reevaluation was automatically cancelled by the system. This is caused by the time and date having been advanced passed the scheduled time and date.
EVT848	This is a link hand-off error. A small number of these a day is a normal occurrence.
EVT849	Synchronization error.
EVT850	Synchronization error.
EVT851	Base Station software diagnostic message.
EVT882	A reevaluation has been initiated. Precedes the Re-eval in prog alarm in the Event/alarm log.
EVT887-01091	The reevaluation radio configuration software has encountered a problematic Base Station (on port 01091 in this case).

Table 36: Event messages in the Admin log

Event code	Meaning
EVT220	The Administration log has been cleared.
EVT400	System has been manually restarted
EVT412	The Installer password has been changed. The parameter contains the extension number that changed the password.
EVT413	The Administration password has been changed. The parameter contains the extension number that changed the password.
EVT414	Someone tried to enter the system with an invalid Installer password.
EVT415	Someone tried to enter the system with an invalid Administration password.
EVT416	Someone has initiated a Configuration programming session.
EVT417	Someone has initiated an Administration programming session.
EVT419	The system time has been changed by a user.

Table 36: Event messages in the Admin log (continued)

Event code	Meaning
EVT434	The Registration password has been changed.
EVT440	An invalid software code has been entered.
EVT450	Someone has initiated a Companion Manager session.

You should rarely see event messages other than those described in Table 32 and Table 36. Other messages occur when the Meridian Companion system has followed its normal recovery from an unusual combination of system events. If the same event number keeps appearing and is not described in Table 32 or Table 36, report it to your installer or distributor.